



CENTRE FOR RENEWABLE AND SUSTAINABLE ENERGY STUDIES

Annual Report 2010

**National Hub for the Postgraduate Programme in
Renewable and Sustainable Energy Studies**

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Centre for Renewable and
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Executive Summary

This report provides an overview of the activities, for the 2010 academic year, of the Centre for Renewable and Sustainable Energy Studies (CRSES), which is responsible for the Postgraduate Programme in Renewable and Sustainable Energy Studies, and is coordinated from Stellenbosch University.

The academic programmes commenced in February 2007 with two coursework master degrees and other existing research masters' and doctoral programmes; in 2008 this was extended by another coursework masters degree. Thirty-four students received bursaries from the Centre for the 2010 academic year while studying at seven different universities. Twenty bursary students completed their masters degrees in 2010 and seven are expected to graduate in the first quarter of 2011. Seven postgraduate modules were presented and a number of projects were successfully completed. Eight forums, covering various topics on renewable and sustainable energy, were held. Three spokes were identified and recommended for support to SANERI in 2007. During 2010, the SANERI contract with the Centre was ceded to the Department of Science and Technology (DST). The total expenditure of the SANERI and DST funds in 2010 was R 6 272 973.20 with a surplus in the account at the end of the year of R 1 848 123.61. SANERI and DST paid a total amount of R 6 329 800 to the Centre. A surplus of only R 56 826.80, or just less than 1%, was realised on the approved budget from SANERI. The total income of the Centre grew by 8.1% to R 9 689 883.81, while expenditure rose to R 8 835 474.89. The total reserves in the Centre at the end of 2010 was R 4 726 375.53.

Of the thirty-four students that received bursaries in 2010 14 (30%) are black and 11 (24%) female. These fall short of the original targets of 85% black and 45% female students. A number of steps were put in place to address this shortfall from 2010 onwards. Thirty-five research papers were published in accredited journals and conference proceedings, due to the activities of the students and the staff members of the Centre.

During 19 and 20 July 2010 the Centre was reviewed by external experts Prof Nelson Ijumba (Vice-Rector: Research from the University of KwaZuluNatal) and Dr Christoph Richter (Deutsches Zentrum für Luft-und Raumfahrt- Institut für Technische Thermodynamik/Solarforschung). The key recommendation of the review is the continued support of the program with additional funding, to facilitate the development of additional active and inter-linked hubs. The complete report is available at: http://academic.sun.ac.za/crses/html/about_history.htm.

The Centre is well positioned to continue with the programmes and projects in 2011 with dedicated staff, motivated students and a supportive University Management.

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1. Introduction

The South African National Energy Research Institute (SANERI), a division of the Central Energy Fund (CEF), awarded Stellenbosch University in 2006 the responsibility to act as the national hub of a Postgraduate Programme in Renewable and Sustainable Energy (RSE) Studies. The programme model described in the original call for proposals was that of a hub that will be supplemented by a number of spokes in different fields of renewable and sustainable energy. The official launch of the Programme took place on Thursday, the 3rd of August 2006, with the signing of the contract between Stellenbosch University and SANERI. The overall objective of this initiative was to develop and enhance national capacity in renewable and sustainable energy in support of accelerated and shared economic growth. This objective was to be achieved by building human resource capacity, creating and disseminating knowledge, and finally by stimulating innovation and enterprise in the field of renewable and sustainable energy (RSE).

In 2010 the original contract between Stellenbosch University and SANERI was ceded by SANERI to the Department of Science and Technology (DST). The DST undertook to honour all obligations of the contract and will in future be the primary funding agency of the Programme. The extension of the existing contract will be negotiated during 2011 with the implementation date set as 1 January 2012.

The primary objective of the Postgraduate Programme in Renewable and Sustainable Energy Studies at Stellenbosch University remains the training of scientists and engineers with the required technical expertise to unlock the country's renewable energy resources on the one hand, and implement appropriate technology for using renewable energy in a sustainable manner on the other. The academic programme started in February 2007 with thirty students enrolled on the coursework masters degrees and various research degrees. In the 2010 academic year seven postgraduate modules were presented, starting with general modules on renewable energy technology and policies, as well as specialised modules such as on solar and bio-energy. A new module with a focus on Renewable Energy Finance was introduced in 2010. A total of thirty-four students received bursaries from SANERI/DST via the Programme while studying at seven different universities in South Africa in 2010.

The Centre for Renewable and Sustainable Energy Studies (CRSES) at Stellenbosch University was established in 2007 to implement the intent of the contract between Stellenbosch University and SANERI/DST and to manage this Programme. The Director of the Centre is Prof Wikus van Niekerk and the Associate Director, from the 1st of September 2009, is Prof Alan Brent. The Centre is currently also involved in a variety of renewable energy projects, from feasibility studies and technology reviews of using solar, wave and wind energy to power a variety of loads, to projects investigating the feasibility of large-scale concentrating solar power plants, as well as the measurement of the available solar resource.

This is the fifth annual report of the Centre and spans the period 1 January to 31 December 2010. It represents the fourth full academic year that the Programme has been in place. In this report the various activities of the Centre are presented, some of the challenges are highlighted, and the financial statements of the period 1 January to 31 December 2010 presented.

2. Academic Programmes

The academic programmes that are coordinated by the Centre currently consist of one postgraduate diploma in engineering (PDE - from 2011), two coursework masters' degree programmes and a variety of research masters' and doctoral degrees. The coursework masters' degrees are presented at Stellenbosch University, one in the Department of

Mechanical and Mechatronic Engineering as an M.Eng. in Mechanical Engineering with an emphasis on RSE and one in the School of Public Leadership as a B.Phil./M.Phil. programme in Sustainable Development, with an option to specialise in RSE. More information on the structure of the PDE, M.Eng. and B.Phil./M.Phil. programmes can be found in Appendix A and at the following website:

http://academic.sun.ac.za/crses/html/postgraduate_program.htm

The research masters' and doctoral degrees are available in various academic departments at Stellenbosch University as well as other universities, in particular the University of Cape Town, University of Pretoria, North West University, University of KwaZulu/Natal, University of Fort Hare and Nelson Mandela Metropolitan University. Students enrol for the research degree in the relevant academic department and work in that research group while completing their studies. A list of research projects available at the various institutions cooperating with the Centre can be found at:

http://academic.sun.ac.za/crses/html/research_topics.htm

The students that are enrolled for the two coursework master degrees, as well as some of the research students, meet in a number of renewable and sustainable energy (RSE) postgraduate modules that are presented in a transdisciplinary manner at the Sustainability Institute, which is situated at Lynedoch outside Stellenbosch. These modules are presented in a modular format where the students are required to do some preparatory reading, attend a week of contact sessions, consisting of five and half days at Lynedoch, which includes a group assignment and presentation, and then they have to complete a number of individual assignments and projects to complete the course. During the week of contact, students participate in lectures, tutorials, group discussions, projects and some site visits. In 2010 seven modules were presented and the numbers of students who attended are listed in Table 1. A new module, Renewable Energy Finance, was introduced in 2010 while Sustainable Land Use was cancelled due to a lack of interest from RSE students.

All of the modules are registered with the Engineering Council of South Africa (ECSA) so that executive students who attend these courses will receive recognition towards their required continuous professional development (CPD points). The modules were also attended by some of the research students and staff members involved with the programme to improve their background learning and understanding of RSE.

Table 1: Attendance of RSE Modules for 2010

<u>Module</u>	<u>Presenters</u>	<u>Total*</u>	<u>Coursework</u>	<u>Research</u>	<u>Staff</u>
Renewable Energy Systems	Dr Ben Sebitosi & Riaan Meyer	29	21	4	2
Renewable Energy Policy	Prof Alan Brent	23	20		1
Conventional Energy Systems	Richard Haines & Riaan Meyer	12	10	1	1
Solar energy	Dr Ben Sebitosi & Paul Gauché	32	13	8	1
Renewable Energy Finance	Jako Volschenk	28	22		1
Wind & Hydro	Prof Theo von Backström & Francis Jackson	33	20	5	2
Bio-energy	Prof Johann Görgens & Team	18	5	8	0

* The total includes the executive and pro-bono students who attend the one week of contact.

Due to the general downturn in the national economy, fewer executive students attended the modules in 2009. In 2010 the enrolment cost was reduced from R 12 500 per module to R 7 500 per module to increase the number of executive students. This proved successful and 26 executive students registered in 2010 as compared to only 11 in 2009.

3. External Review

An external review of the Centre for Renewable and Sustainable Energy Studies (CRSES) was commissioned in 2010 to implement a decision taken by the Management Board of the Centre. According to the Terms of Reference, the review, covering the period January 2007 to December 2009, was to address and make recommendations to the Management Board with regard to the following aspects:

- The bursary programme;
- The coursework masters programme;
- The research projects;
- The coordination of the spokes in renewable energy;
- The public awareness activities;
- The management and financial reporting structure; and
- The future strategic goals.

The review took place over the period 19 to 20 July 2010 and the Review Committee members were:

- Prof Nelson Ijumba - Vice-Rector: Research from the University of KwaZulu/Natal
- Dr Christoph Richter - Deutsches Zentrum für Luft-und Raumfahrt (the DLR) Institute for Technical Thermodynamics, Solar Research.

The Committee interviewed staff and students, visited various sites and departments within the University, with which the Centre is collaborating, as well as the Sustainability Institute. Stakeholders from various government departments, industry and organisations with an interest in the activities of the Centre were also approached to submit comments directly to the reviewers.

The Review Committee concluded that:

“As an overall assessment and recommendation for future development, the reviewers would like to congratulate SANERI for having initiated this activities and the team of CRSES for the successful way the Centre has operated over the last three years. Currently several studies have shown how Renewable Energy could grow to a major (up to 100%) contributor for a safe and clean energy supply over the next decades e. g. in Europe, and certainly the same would be possible in South Africa, especially in view of the vast and excellent resource in solar energy available here. The activities of CRSES, therefore, should continue and be further intensified, which will require additional funding. This would be necessary to dedicate a major effort to multiply the activities by creating more active “hubs” all over the country. The latter also might help to increase the share of black citizens (students and professionals) in the work programme, especially bursaries and coursework masters, and help at the same time to give a broader national network as essential support for a future increased deployment of Renewable Energy Technology for domestic and (technology) export purposes in South Africa”.

The complete Review can be viewed at:
http://academic.sun.ac.za/crses/html/about_history.htm

4. Students and Bursaries

In 2010 SANERI/DST made an amount of R 2.5 million available for postgraduate bursaries. In total 34 students at six different universities in South Africa of whom 14 (30%) were black and 11 (24%) female received bursaries from the Centre:

- Most students progressed well and 7 Masters' students graduated in December 2010, and another 7 Masters students are expected to graduate in March/April 2011.
- In 2010 an amount of R 1 530 000 was paid to continuing students and R 895 000 to new students.
- An amount of R 200 000 was paid to new bursary students to acquire laptop computers.

A complete list of the students who received bursaries in 2010 is included as Appendix B.

5. Projects

A number of projects were completed in 2010. Table 2 indicates the scope of the more significant projects completed in 2010, while Table 3 provides the details of those projects that are continuing into 2011.

Table 2: Projects completed in 2010

Project Description	Client	Amount
MeerKAT and SKA Solar Energy Study (with Hatch Africa Energy)	DST and SKA Project Office	R 1 300 000
Solar energy baseline study, technology roadmap and business plan	CSIR (DST)	R 200 000
Assessment of wave energy converted	Wave Air Generation (WAG)	R 171 000
Assessment of ocean current turbine system	Sea Renewable Energy	R 125 000
Training of staff in Single Buyers Office	Eskom	R 54 114

Table 3: Projects continuing in 2011

Project Description	Client	Amount
Solar and wind resource mapping and training	UNEP	R 1 550 000
SWH testing and training	Austrian Development Agency	R 850 000
Solar resource measurement and assessments, Lepalale	Exxaro	R 575 000
Solar resource measurement and assessments, Upington	SolAfrica	R 261 634
Solar resource measurement and assessments, Botswana	Exxaro	R 350 509

On these projects both staff of the Centre, as well as other expert consultants in the University and private industry, combined to form strong, multi-disciplinary project teams to execute the technical work. A number of international partners also contacted the Centre to discuss cooperation; examples are the GTZ and the German Development Bank who are interested to partner with the Centre on wind and CSP projects, and IIASA who want to collaborate to develop regional-scale models to inform renewable energy oriented policy.

The projects undertaken by the Centre range from initial feasibility studies for the deployment of renewable energy, to highly technical studies on specific technologies. The Centre is also regularly requested to assess the ideas of individual entrepreneurs that are referred to the Centre by SANERI, DST, DoE and others. The Sea Renewable Energy turbine system is one of these that may lead to a significant future research project if the current application for funding to the Technology Innovation Agency is successful. A register of these ideas and the responses of the Centre are kept, as requested by SANERI and DST.

Research work on the Stellenbosch Wave Energy Converter is continuing with funds allocated by the University under the Overarching Strategic Plan. In 2010 a new international patent application was submitted on this device. This patent extends the application of the original Stellenbosch Wave Energy Converter, or SWEC, to a shore-based unit, and a PhD student is continuing this work.

The Centre is also playing a coordinating and facilitating role in a number of flagship projects:

- South African Wind Energy Centre (SAWEC) project to establish a research, development and training facility in the Western Cape for the wind energy sector.
- Southern African Solar Resource Database project, which will include 10 to 20 ground stations to accurately measure solar radiation, updating satellite derived solar data and establishing expertise in South Africa to interpret and assess the information.
- Small-Scale CSP Demonstration Plant and Research Station, which will be built as a public-private partnership.

6. Forums and Awareness Programmes

In order to fulfil the public awareness mandate of the Programme a number of RSE forums were again held during the course of 2010. These events were very successful and well attended, as usual. Most of the forums also received additional coverage in the print and radio media. The topics and attendance of the forums are listed in Table 4.

Table 4: Attendance of RSE Forums in 2010

<u>Topic</u>	Climate Change – Feedback from COP15, Copenhagen, Denmark	Bio-diesel from algae	RE Grid Connections	Biogas for Energy	Sustainable Architecture	Renewable Energy Finance	Wave Energy	Concentrated Carbon Sequestration
<u>Attendees</u>	105	56	58	50	46	96	40	56

The format of these forums is that two independent experts are invited to introduce the topic, typically twenty minutes each, and then the floor is opened for a general debate between the members of the audience with additional inputs from the experts. Afterwards a small reception is held for additional informal discussions between the participants. This format proved to be very effective in the past, but it was decided that a new format will be investigated in 2011, which will also include more research lectures.

One research lecture on *The Use of Concentrated Solar Radiation in Upgrading Fossil Fuels* by Dr Christiaan Sattler from the German DLR was presented and it is proposed that more research lectures will be held in 2011. A number of the students, supported by the Centre, also presented research lectures at their respective institutions and other forums.

The first Post Graduate Renewable Energy Symposium was held from 12 to 13 November 2010 at the Sustainability Institute, and was well attended by students from all over the

country. Twenty-one post-graduate students from the University of Pretoria, North West University, University of Fort Hare, University of KwaZulu Natal, Nelson Mandela Metropolitan University, University of Cape Town and Stellenbosch University presented papers. The aim of the symposium was to create a forum for postgraduate students. The students' travel and accommodation was sponsored by the Centre from the SANERI/DST grant. Dieter Matzner from Hatch Africa was the guest speaker at this event. This symposium was a great success and will become an annual event to highlight the work of postgraduate students in the Programme. The papers are available on the website:

<http://academic.sun.ac.za/crses/html/forums3.htm>

In addition to the forums, research lectures and postgraduate symposium, a school outreach project was initiated in 2008. Therese Lambrecht, an experienced project manager with a passion for climate change and renewable energy, developed material on climate change and renewable energy suitable for the grades 6 to 9. The material now consists of a video, PowerPoint presentation, and a workbook. During 2010 the material was distributed to 93 secondary and 24 primary schools in the Western Cape Province.

The Director and Associate Director were invited to participate and present lectures in a number of other events throughout the year. One of the more notable events was a joint workshop between the South African Academy of Engineering and the Australian Academy of Technological Sciences and Engineering on Energy Technologies for a Low Carbon Future, where the Director was asked to present a lecture and participate in panel discussions. The Director also participated in visits, on the invitation of the Western Cape Provincial Government, by delegations from Bavaria and Austria. The Director also visited Spain, Belgium and the United States in 2010 for a study tour to various CSP plants and research institutions and attend two conferences.

The Associate Director was invited to Sweden, to present a paper at a Clean Technology, Green Solutions Conference, with financial support of the Swedish Government. The Associate Director was also invited by the private sector – PricewaterhouseCoopers, Shell, and the Cape Business Chambers – to give talks and participate in panel-type discussions. The Associate Director is now also an invited participant of the parliamentary committee on energy.

7. Spokes and Partnerships

The proposed model for the Programme was that of a hub complemented with spokes. Spokes focus on a particular technology, such as solar and wind energy. A process was undertaken in 2007 where calls were solicited from a number of universities and these were then evaluated by the Management Board of the Programme. The following three spoke applications were recommended to SANERI:

- *Photovoltaic Research and Teaching* from NMMU and University of Fort Hare
- *Solar Thermal Power Generation* from Stellenbosch University and University of Pretoria
- *Technologies for Wind Energy* from University of Cape Town and Stellenbosch University

Funding of the spokes remained problematic. SANERI was able to provide very limited funding in 2009 and then also only at a very late stage in the academic year to support the activities. The DST assumed the responsibility for the spokes during the course of 2010 and undertook to increase the funding of each spoke from R 600 000 to R 1 million. Unfortunately this funding was only made available late in December with the effect that these funds will only be utilised in 2011. This resulted in a significant scaling-down of the proposed activities and significant challenges at all spokes. There is no clarity on the future funding of the spokes

and at present no new spokes are being developed. However, relationships with spokes are well established and remain healthy. If sufficient funding for the spokes will become available they will be able to contribute to RSE research and may even develop into centres of excellence in their own right.

The Centre was instrumental to negotiate a five-year, R 3 million grant from Sasol to support a senior researcher in solar thermal energy in the Department of Mechanical & Mechatronic Engineering. This was in part possible due to an allocation of R 4 million by Stellenbosch University from its strategic funds to promote solar thermal energy research. In addition to this, Sasol made available an amount of R 4 million in 2010 towards the development of new facilities for the Centre. A new building is currently being constructed and the Centre, as well as the Solar Thermal Energy Research Group of the Department of Mechanical & Mechatronic Engineering, will be housed on the top floor of the new building.

8. Staff

During 2010 Mr Warrick Pierce was appointed as a research engineer, and Mari Grobler as a half day administrative officer, for a period of two years. Duncan Palmer resigned at the end of 2010 to pursue full-time studies for an MBA. Two new research engineers were appointed in 2011, Corli Leonard and Josh Reinecke.

The full-time staff complement at the end of 2010 is shown in Table 5.

Table 5: Full-time staff complement in 2010

<u>Position</u>	<u>Incumbent</u>
Director (80% appointment) (M&M)	Prof Wikus van Niekerk
Associate Director and Professor in the SPL	Prof Alan Brent
Senior Lecturer (M&M)	Dr Ben Sebitosi
Research Engineer	Mr Riaan Meyer
Research Engineer	Mr Duncan Palmer (resigned December 2010)
Research Engineer	Mr Warrick Pierce
Admin/Finance Officer	Ms Jos Liebenberg
Admin Officer	Ms Mari Grobler (Appointed 1 July 2010)

9. Financial Reporting

In January 2010 SANERI transferred R 3 164 900 and in the second semester the DST, after the ceding of the SANERI contract to DST, transferred a further R3 164 900 to Stellenbosch University to support the Programme. These amounts were for the core grant, R 3 829 800, and bursaries, R 2 500 000. The SANERI/DST funds are all held in a separate account, cost point **11550**, to ensure easy auditing of how these funds were applied by the Centre according to the existing contract and approved budget. In addition to the SANERI/DST payments interest to the value of R 85 449.62 accrued in this cost point as well as repayments of bursaries of R 27 500, and repayment of expenses on a Telkom account that was taken over by the Sustainability Institute of R 8 329.73 to bring the total income for 2010 to R 6 451 447.74.

Table 6 lists the income into cost point 11550.

Table 6: Income received in SANERI cost point 11550 for 2010

		<u>Budgeted</u>	<u>Actual</u>
SANERI/DST:		<u>R 6 392 800</u>	<u>R 6 392 800.00</u>
	Core Grant	R 3 829 800	R 3 829 800.00
	Bursaries	R 2 500 000	R 2 500 000.00
Other:		<u>R 0</u>	<u>R 121 647.74</u>
	Interest		R 85,449.62
	Diverse Income		R 8 329.73
	Income: Bursary repayments		R 27 500.00
	Exchange rate profit		R 368.39
	Total income in costpoint 11550 for 2010		<u>R 6 451 447.74</u>

The budgeted and actual expenses of the funding received from SANERI/DST as Core Grant and for Bursaries in 2010 are reflected in Table 7.

The major variances in the actual expenditure from the budgeted amounts were for running expenses and computers for students. Under running expenses, the major over-expenditure was for conferences, workshops and travel. Travel expenses of staff include mainly trips to Gauteng to liaise with government departments, Eskom and industry which are all located there. The Centre is also frequently requested to represent Stellenbosch University or the academia in a broader sense at national events. Under capital expenses there were only budgeted for ten students' laptops, R 100 000, but eventually 20 new students received bursaries, hence an overrun of R 100 000 was incurred.

In total R6 272 973.20 of the R 6 392 800 received from SANERI/DST was spent in 2010; leaving R 56 826.80 or less than 1% that was not applied towards the expenses of the Programme and therefore accrued in the reserves of the Centre. The reserve at the end of the year in this cost point came to R1 848 123.61. These funds are kept in reserves to make provision for late payments from SANERI/DST, as happened again in 2010, as well as to support the continuing bursary students should the DST funding be terminated.

In addition to the SANERI/DST funding, other sources of funding were further developed in 2010. The one week of contact of the RSE modules at Lynedoch are made available as short courses to industry. In 2010, twenty-six executive students attended the various modules generating a net income of R 157 947.26. These funds are kept in a separate cost point, R1111, and the available funds in this cost point at the end of 2010 were R 616 629.17. The turnover of projects in 2010 grew to just more than R 3 million in 2010. The reserves in the Centre, excluding the reserves in the SANERI/DST cost point (11550) and in the short course cost point (R1111) at the end of 2010, was R 2 261 623. These reserves are required by an agreement with the Department of Mechanical and Mechatronic in order to appoint the full-time staff of the Centre. The total reserves at the end of 2010 came to R 4 726 375.53, which indicates that the Centre is in a very stable and favourable financial position. It should, however, be pointed out that this is just over half of the 2011 approved budget of the Programme from the DST and that late payments by the DST is still a risk to the cash flow of the Centre.

Table 7: Expenditure for 2010 from SANERI/DST Grant

		Budgeted	Actual	Still Available
1. Staff		R 3,092,800.00	R 3,077,911.28	R 14,888.72
	Centre Staff Cost	R 2,652,800.00	R 2,868,860.74	-R 216,060.74
	Additional lecturing staff	R 440,000.00	R 209,050.54	R 230,949.46
2. Running Expenses		R 482,000.00	R 542,734.77	-R 60,734.77
	Telephone, fax and internet	R 60,000.00	R 48,811.08	R 11,188.92
	Stationary and printing	R 22,000.00	R 20,757.97	R 1,242.03
	Travel (Staff Members)	R 70,000.00	R 98,228.94	R -28,228.94
	Travel (Students, Visiting Academics)	R 40,000.00	R 25,689.46	R 14,310.54
	Advertisements (incl website)	R 150,000.00	R 123,485.85	R 26,515.25
	Conferences and workshops	R 70,000.00	R 138,104.87	R -68,104.87
	Community Projects	R 70,000.00	R 69,963.50	R 36.50
	Office refurbishment & maintenance		R 17,693.60	-R 17,693.60
3. Academic Expenses		R 45,000.00	R 6,668.00	R 38,332.00
	Teaching Material & Books	R 45,000.00	R 6,668.00	R 38,332.00
4. Capital Expenses		R 145,000.00	R 42,852.13	R 102,147.87
	Office furniture and equipment	R 10,000.00	R 14,973.92	-R 4,973.92
	Classroom furniture	R 10,000.00	R 9,120.00	R 880.00
	Computers (Students)	R 100,000.00	R 0	R 100,000.00
	Computers Equipment (Staff)	R 25,000.00	R 18,758.21	R 6,241.79
5. Contingency			R 0.00	R 65,000.00
	5% Contingency of total amount	R 65,000.00	R 0	R 65,000.00
	Total SANERI/DST Core Expenditure for 2010	R 3 829 800.00	R 3,670,166.18	R 159,633.82
7. Bursaries		R 2,500,000.00	R 2,602,807.02	-R 102,807.02
	SANERI Bursary Grant	R 2,500,000.00	R 2,402,807.02	R 97,192.98
	From SANERI Core Grant	R 0.00		
	From CRSES Reserves	R 0.00		
	Computers Equipment (Students)	(R 100,000.00)	R 200,000.00	-R 100,000.00
	Total SANERI/DST Bursary Expenditure for 2010	R 2 500 000	R 2,602,807.02	-R 102,807.02
	Total SANERI/DST Expenditure for 2010	R 6 392 800.00	R 6,272,973.20	R 56,826.80

Audited financial statements are included in Appendix C. The first set is the consolidated income and expenditure for all the accounts (cost points) of the Centre. The second set represents only that of cost point 11550, the cost point in which all the SANERI/DST funding are received and disbursed.

The presence of the Centre at Lynedoch has been downscaled. It was found that students prefer to stay on campus in Stellenbosch and only the Associate Director of the Centre, Prof Brent, still has a desk at Lynedoch. However, all the RSE modules are still presented on the premises of the Sustainability Institute at Lynedoch and this is being sponsored through a grant by the Spier Group.

The approved budget for 2011 requires a contribution from the DST of R 7 037 000, R 4 037 000 for the Core Grant and R 3 million for Bursaries. The approved budget for 2011 is shown in Appendix D.

10. Equity Targets

In the Agreement signed between SANERI/DST and Stellenbosch University the following equity targets were set for the students funded with bursaries over the entire five-year initial term:

- Black (including Indian and Coloured persons): 85%
- Female: 45%

In Section 3 it was reported that these targets have not been met. The following actions were taken to meet these very ambitious targets:

- Advertisements were placed in publications that are widely read in the targeted communities such as the Sunday Times.
- All suitable black candidates were carefully listed and followed-up to ensure that they apply for the available bursaries.
- In some cases additional expenses were incurred to interview suitable candidates or assist with additional funding.

In selecting the successful candidates for the bursaries the criteria that were used to allocate priority to certain candidates are summarised in Table 8.

Table 8: Point system used as selection criteria

Equity		Excellence	
Black Female	3 points	Distinction (75% +)	3 points
Black Male	2 points	Very good (65% to 75%)	2 points
White Female	2 points	Good (55% to 65%)	1 point
White Male	1 point	Poor (less than 55%)	0 points

The two scores were added and all candidates with a total of 4 or more points were typically awarded a bursary in 2010. In addition, some candidates with 3 points were awarded with bursaries if the field of study was deemed important. The external reviewers commended the Centre with this system and supported the continuation thereof.

The complete list of all the students who were funded in 2010 is provided in Appendix B. The demographics of the students who received bursaries are as follows:

White: 64%	Male: 74%
Black: 36%	Female: 26%

It is clear that the targets of 85% Black and 45% Female remain a challenge to meet. The current strategy, which included personal contact and advertisements in national newspapers, which are widely read in the black community, led to an improvement in the number of new black students to 36% for 2010; however, the participation of females declined to below 30%. It is clear that the largest constraint on meeting these targets is the demographic profile of the target market; black and female students with a suitable four-year bachelors or honours degree. It is well known that the numbers of black students who participate in tertiary education programmes are still small, and well below these demographic targets. What is even more problematic is that this Programme is a postgraduate programme and that there are very attractive employment opportunities for black graduates in South Africa, mainly driven by the skills shortage and employers trying to meet their own equity targets, which makes it even more difficult to attract black students into the Programme.

A proposal was made to the DST to appoint black interns in 2011 who will then be allowed to study towards a postgraduate degree while they are actively involved in an existing research programme.

11. Research outputs

The research outputs from the Centre have increased substantially; these are listed in Appendix F, mainly due to the fact that the results of the research of the previous years are now being published. Many of the research students' work has led to international publications and is included in the research outputs of the Centre. During 2010, sixteen papers were published in accredited journals, with four also accepted for publication during 2011. Nineteen papers were presented at national and international conferences, and subsequently included in those proceedings. A number of papers have already been accepted for 2011 conferences. These numbers reflect the impact of the Centre from an academic/research perspective.

One international patent is currently being registered. There are also 27 masters' theses and 3 doctoral dissertations listed on the Centre website:

http://academic.sun.ac.za/crses/html/research_topics3.html

12. Conclusions

A number of objectives were met in the fourth academic year of the programme:

- The basic academic, administrative and financial structures were strengthened to execute the contract between Stellenbosch University and SANERI/DST.
- A very few favourable, independent, external review was received.
- The contractual obligations of SANERI have now been ceded to the DST and the required documents to effect this change have been put in place.
- During 2010, thirty-four students were supported with bursaries at seven different universities in South Africa.
- Twenty students received their masters' degrees in 2010 with another seven expected to graduate in March/April 2011. Three doctoral students received their degrees in March/April graduation ceremonies.
- Eight Discussion Forums on Renewable and Sustainable Energy topics were organised and well attended.
- A number of new projects in the field of renewable energy were undertaken, including three, national flagships projects.
- The Centre established itself as a national resource for information on renewable energy, which is now also internationally known. This is reflected in the number of

papers that have been published in journal and conference proceedings – a total of thirty-five in the 2010 academic year.

All this was achieved while maintaining responsible financial management and establishing a sufficient reserve for the Centre to ensure continuing economic viability despite cash flow constraints due to late payments.

There were also some challenges to deal with:

- Finding good students, especially Black students, will remain a challenge for many years to come.
- The late payment of funds from the DST in the second half of the year caused a discomfort for the Centre.
- A new contract for the next period, 2012-2017, needs to be negotiated and signed in 2011.

We look forward to a challenging and exciting 2011!

Appendix A: Coursework Masters Programmes

Postgraduate Programme in Renewable and Sustainable Energy Studies		
<p>M.Eng. (180 US credits) Coursework 120 Credits: (1 Math & 2 Adv Mech Eng Modules; 5 RSE Modules, including Sustainable Development Project 60 Credits)</p>	<p><u>Coursework Masters Programmes</u></p>	<p>B.Phil. (120 US credits) M.Phil. (120 US credits) Coursework 120 Credits (8 Modules) (B.Phil.) Project 120 Credits (or 90/60 Credits and 2/4 additional Modules) (M.Phil.)</p>
<p>Engineering:</p> <ul style="list-style-type: none"> <u>Mathematics: One of Linear Algebra or Partial Differential Equations (15 Credits)</u> <p>Take at least two more for M.Eng. from:</p> <ul style="list-style-type: none"> Conventional Energy Systems* Advanced Heat Transfer Advanced Fluid-Dynamics Advanced Dynamics Advanced Strength of Materials <p>Required module from Sustainable Development Programme:</p> <ul style="list-style-type: none"> <u>Sustainable Development (15 US credits)</u> <p><u>Underlined courses are required.</u></p>	<p>Renewable & Sustainable Energy Modules (15 Credits): (Take at least 4 for M.Eng. and B.Phil.)</p> <ul style="list-style-type: none"> <u>Renewable Energy Systems</u> <u>Renewable Energy Policy</u> <p>or</p> <ul style="list-style-type: none"> <u>Renewable Energy Finance</u> <u>Solar Energy (PV and Thermal)</u> <u>Bio-Energy</u> <u>Renewable Energy Finance</u> <u>Wind and Hydro Energy</u> <p><u>Underlined courses are required.</u></p>	<p>Sustainable Development and Planning Modules (15 Credits each):</p> <ul style="list-style-type: none"> <u>Sustainable Development</u> <u>Ecological Design for Community Building</u> <p>(Take at least one more for B.Phil.)</p> <ul style="list-style-type: none"> Leadership and Ethics Globalisation, Governance and Civil Society Applied Economics Corporate Citizenship Complexity Theory and Systems Thinking Biodiversity and Sustainable Agriculture Sustainable Cities System Dynamics Modelling <p><u>Underlined courses are required.</u></p>
<p>Host Department:</p> <p>Department of Mechanical & Mechatronic Engineering</p>	<p>Host departments: Mechanical & Mechatronic Eng., School for Public Leadership, Process Engineering.</p>	<p>Host Department:</p> <p>School for Public Leadership</p>

APPENDIX B: List of Bursary Students in 2010

	Title	Surname	Name	Degree	Department & University	Supervisor(s)
1	Mr	Diedericks	Danie	PhD	Process Eng, SU	J Gorgens
2	Mrs	Krintzinger	Karin	MPhil	SPL, SU	M Swilling
3	Ms	Wassung	Natalie Jane	MPhil	SPL, SU	M Swilling
4	Mr	Gerber	Stiaan	MScEng	Electrical & Electr, SU	J Strauss
5	Mr	Bekker	JC (Nelius)	MScEng	Electrical & Electr, SU	J Vermeulen
6	Mr	Joubert	James Rattray	PhD	Mechanical Engineering, SU	JL v Niekerk
7	Ms	Gijjar	Sumetee Pahwa	PhD	SPL, SU	M Swilling
8	Mr	Wakeford	Jeremy	PhD	SPL, SU	M Swilling
9	Mr	Mabizela	Polycarb Sbusiso	MSc - UFH	Chemistry Dept, UFH	E Meyer
10	Mr	Thantsha	Nicolas Matome	PhD - NMMU	Physics, NMMU	E van Dyk
11	Mr	Menzies	Greig Hamilton	MCom	Economics, NMMU	E v Dyk & S Hoskins
12	Mr	Mouzouris	Michael	MScEng	Mechanical Eng, UKZN	M Brooks
13	Mr	Moody	Matthew Peter	BPhil/MPhil	SPL, SU	M Swilling
14	Mr	Robinson	Paul Blake	BPhil/MPhil	SPL, SU	M Swilling
15	Ms	Trautmann	Christina, K	MScEng	ERC/UCT	Andrew Marquard
16	Mr	Du Plessis	Pieter Coetzee	MScEng	ERC/UCT	Brett Cohen
17	Mr	Hoffmann	Ulwin	MScEng	Electr & Electron, SU	M Kamper
18	Mr	Du Plessis	Jacques	MScEng	Mechanical Eng, SU	W v Niekerk
19	Mr	Schenke	Carlo	PhD	Electr & Electron, SU	W Perold
20	Mr	Kotze	Johannes Paulus	PhD	Mechanical Eng, SU	T v Backstrom
21	Mr	Allen	Kenneth Guy	PhD	Mechanical Eng, SU	Prof D Kröger
22	Mr	Malatji	Pholoso	PhD	Forestry, SU	M Meincken & T Kleynhans
23	Ms	Bergh	Caitlin	MScEng	ERC, UCT	Brett Cohen
24	Ms	Tait	Louise M	MSc	ERC, UCT	G Prasaf
25	Ms	Coppez	Gabby	MSc Eng	ERC, UCT	SP Chowdhury
26	Ms	Crozier	Jacqueline Louise	MSc	Physics, NMMU	Prof E van Dyk
27	Mr	Beukes	Justin	MCom	Economics, NMMU	M du Preez & E v Dyk
28	Me	Mutepe	Rendani Daphney	MScEng	Mineral & Chem Eng, NWU	S Marx
29	Mr	Baloyi	Hope	MSc	Mineral & Chem Eng, NWU	S Marx
30	Me	Meintjies	Maria Magdalena	MEng	Mineral & Chem Eng, NWU	S Marx
31	Mr	Du Clou	Sven	MSc	Mechanical Eng, SU	M Brooks
32	Mr	Stander	Johan Nico	PhD	Mechanical Eng, SU	G Venter
33	Ms	Hyman	Katherine Rose	MPhil	SPL, SU	Mark Swilling
34	Ms	Njingana	Primrose Nosicelo	MSc	Chemistry, UFH	E Meyer

The following bursary students graduated in 2008:

Ms L Beviss-Challinor with a MEng (*cum laude*) in Mechanical Engineering, graduation in March 2008
 Mr W Kruger with an MPhil, graduation in March 2008

Mr JH du Toit with a BPhil (*cum laude*), graduation in December 2008, continuing with his MPhil in 2009
 Ms G Smit with a BPhil (*cum laude*), graduation in March 2008, continuing with her MPhil in 2008,
 Ms K Moloto with a BPhil, graduation in March 2008, continuing with her MPhil in 2008



Mr James Joubert with an MScEng (*cum laude*) in Civil Engineering, graduation in March 2008, continuing with his PhD in 2009
Mr R Solomon with an MScEng in Electrical Engineering, graduation April 2008
Mr D Palmer with an MScEng in Process Engineering, graduation December 2008

The following bursary students graduated in 2009

Mr T Gosa with a BPhil, graduation in March 2009, continuing with his MPhil in 2009
Ms C Lagrange with a BPhil (*cum laude*), graduation in March 2009, continuing with her MPhil in 2009
Mr MB Mokheseng with a BPhil, graduation in March 2009, continuing with his MPhil in 2009
Mr N Sibisi with a BPhil, graduation in March 2009, continuing with his MPhil in 2009

Mr M Maliage with a MEng in Mechanical Engineering, graduation in March 2009
Mr K Rautenbach with a MEng in Mechanical Engineering in March 2009
Ms G Smith with an MPhil (*cum laude*) in March 2009
Mr R du Toit with an MPhil in March 2009

Mr J Heyns with an MScEng in Mechanical Engineering in March 2009
Mr W Pierce with an MScEng in Mechanical Engineering in March 2009
Ms E Viljoen with an MScEng in Process Engineering in March 2009

Mr DV Garach with a BEng(Hons) in April 2009, continuing with his MEng in 2009
Ms M Hallquist with a BEng (Hons) in April 2009, continuing with her MEng in 2009
Mr MPM Ntuli with a BEng(Hons) in April 2009, continuing with his MEng in 2009
Mr SM Roux with a BEng(Hons) in April 2009, continuing with his MEng in 2009
Ms L Smith with a BEng(Hons) in April 2009, continuing with her MEng in 2009
Mr JAL Coetzee with a BEng(Hons) in April 2009, continuing with his MEng in 2009
Mr R Suliman with a BEng(Hons) in April 2009, continuing with his MEng in 2009

Ms Refiloe Ntoi with a BPhil, graduation in December 2009
Ms Natalie J Wassung with a BPhil (*cum laude*), graduation December 2009, continuing with her MPhil in 2010

Mr Pholoso Malatji with an MFor in Forestry, graduation in December 2009
Ms Stella Maphiri with an MSc in Forestry in December 2009

Mr Warren Morse with an MScEng, graduation in December 2009

The following bursary students graduated in 2010

Ms Karin Kritzinger with a BPhil (*cum laude*), graduation in March 2010, continuing with her MPhil in 2010
Mr Motala B Mokheseng with an MPhil (*cum laude*), graduation in March 2010
Ms Katlego Moloto with an MPhil, graduation in March 2010

Mr Richard Donkin with a MEng (*cum laude*) Mechanical Engineering, graduation in March 2010

Ms Ilse Botman with an MSc in Forestry, graduation in March 2010
Mr Paul H Ackerman with an MScEng in Mechanical Engineering, graduation March 2010
Mr Kenneth G Allan with an MScEng (*cum laude*) in Mechanical Engineering, graduation in March 2010, he will continue with his PhD in 2010
Mr Johannes P Kotze with an MScEng in Mechanical Engineering, graduation in March 2010, he will continue with his PhD in 2010
Mr Adriaan Lombard with an MScEng (*cum laude*) in Electrical and Electronic Engineering, graduation in March 2010
Mr John NF O'Kenny with an MScEng in Industrial Engineering, graduation March 2010
Mr Ebenezer Prah with an MScEng in Process Engineering, graduation in March 2010
Mr Abraham van der Merwe with an MScEng in Process Engineering, graduation in March 2010

Ms Nadia Leibbrandt with a PhD, graduation in March 2010.
Mr Jonathan A Olivier with a PhD, graduation April 2010.
Mr Nicolas M Thantsha with a PhD graduation April 2010.

Mr Sinethemba A Nongauza with an MSc in Chemistry, graduation in September 2010.
Ms Tandokazi Y Nquma with an MSc in Chemistry, graduation September 2010.

Mr Stefan T Sager with a MScEng in Electrical Engineering, graduation June 2010.

Mr Matthew P Moody with an BPhil, graduation in December 2010, continuing with his MPhil in 2011.
Ms Chantal Sasha Langrange with an MPhil *cum laude*, graduation in December 2010.
Mr Hendrik J du Toit with an MPhil, graduation in December 2010.
Ms Natalie Wassung with an MPhil, graduation in December 2010.

Mr Thomas J Hugo with an MScEng, graduation in December 2010
Mr Johannes A Stegmann with an MScEng *cum laude*, graduation in December 2010.
Ms Mary K Waller with an MSc, graduation December 2010.

The following bursary students are expected to graduate in March/April 2011

Ms Karin Kritzinger with an MPhil graduation in March 2011.
Mr Paul B Robinson with an MPhil graduation in March 2011.
Ms Katherine Hyman with an MPhil, graduation March 2011.

Mr Greig Menzies with a MCom graduation in April 2011.

Mr Michael Mouzouris with a MScEng graduation April 2011.
Mr Stiaan Gerber with a MScEng graduation March 2011.
Mr Johannes H Potgieter with a MScEng graduation in March 2011.

Appendix C: Financial Statement, all cost points



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Statement of Income & Expenditure - OE 1155

For the period ending :

	31/12/2010	31/12/2009
TOTAL INCOME	-9 689 883.81	-8 964 037.98
CONFERENCE/CONGRESS (NO VAT)	-249 258.06	-220 776.00
INCOME: BURSARY	-2 527 500.00	-174 396.68
INCOME: FOREIGN_ZERO RATE	-840 589.74	-1 066 901.08
INCOME: SUNDRY TAXABLE	-1 943 869.14	-1 162 570.94
INTEREST RECEIVE: INTERNAL ALL	-245 484.88	-191 562.59
PROFIT/LOSS: EXCHANGE RATE DEB	0.00	-1 156.59
PROFIT: EXCHANGE RATE FOREIGN	-2 302.90	-270.54
SALES: TO INTERNAL ORG UNITS	-50 039.92	-47.94
SUNDRY INTEREST RECEIVED	-1 039.17	144.38
SUNDRY INCOME: NON TAXABLE	-3 829 800.00	-6 146 500.00
TOTAL EXPENDITURE	7 582 610.86	6 595 362.13
CURRENT EXPENDITURE		
ADVERTISEMENTS: GENERAL	109 616.70	97 687.85
ADVERTISEMENTS: POSTS	0.00	38 258.65
AFFILIATION & REGISTRATION EXP	39 167.22	72 864.61
BURSARY POST GRADUATE	2 729 750.00	3 633 974.49
CELL PHONE AIRTIME	9 356.46	4 202.29
CELL PHONE RENT	5 734.98	5 801.70
CLEANING MATERIALS	0.00	119.14
CLEARANCE FEE NON-CAPITOL	550.78	0.00
CLOTHING: OTHER	4 470.34	12 633.11
COMPUTER MATERIALS	13 656.47	5 495.26
CONSULTATION FEES	1 374 353.54	545 490.83
CONSUMABLE MATERIALS	50 922.86	3 001.68
COPY AND PRINTING	33 468.37	27 991.46
COURSES	3 718.00	4 162.45
ENTERTAINMENT: GENERAL	133 597.56	53 849.08
FLOWERS, WREATHS, GIFTS	4 327.36	6 294.61
FOREIGN EXCHANGE LOSS	1 569.50	9 568.53
FOREIGN TRAVEL & SUBSISTENCE	75 118.96	86 889.32
INTEREST PAID: INTERNAL APPOR	5 987.94	9 095.39
INTERNET NETWORK EMAIL LEVY	8 457.34	23 933.13
IRRECOVERABLE DEBT WRITTEN OFF	62 763.13	0.00
LEVY: SURCHARGE	26 370.96	16 230.00
MAINTENANCE OF APPARATUS EN/O	0.00	342.00
NON-CAPITALISED BOOKS	4 400.00	2 405.00
POSTAGE STAMPS AND TELEGRAMS	3 881.65	2 080.75
PRIZES AND MEDALS	4 500.00	1 000.00
PROMOTION MATERIAL	513.00	10 326.70
RENT OF EQUIPMENT GENERAL	650.00	0.00
RENT OF ROOMS	9 050.00	500.00
SERVICES	32 985.22	15 483.00
SMALLER FURNITURE AND EQUIPMEN	13 073.07	10 762.48
SOFTWARE	36 188.05	28 422.04
STATIONERY	17 695.14	18 812.35
SUBSCRIPTION BOOKS & MAGAZINES	3 052.40	600.00
SUNDRY EXPENSES	14 000.00	11 668.75
TELEPHONE INSTALLATION COSTS	394.44	0.00
TELEPHONE: CALLS	9 564.15	10 916.75





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Statement of Income & Expenditure - OE 1155

For the period ending :	31/12/2010	31/12/2009
TELEPHONE: RENT	17 501.59	20 409.88
TOTAL REMUNERATION	2 048 992.40	1 511 779.18
TRAVEL & SUBSISTENCE: DEPARTM	156 378.29	144 659.80
TRAVEL & SUBSISTENCE: NON TEAT	193 603.62	98 792.04
WORKSHOPS	93 228.79	19 710.00
ASSET TRANSACTIONS		
ASSET PURCHASES	230 000.58	29 147.83
OPERATING (SURPLUS) / SHORTFALL FOR PERIOD	-2 107 272.95	-2 368 675.85
FUNDS TRANSFERS	1 252 864.03	694 806.00
TRANSFERS FROM	1 285 569.03	698 511.00
TRANSFERS TO	-32 705.00	-3 705.00
NET (SURPLUS) / SHORTFALL FOR THE PERIOD	-854 408.92	-1 673 869.85
Plus: ACCUM (FUNDS) / SHORTFALL ON 01/01/2010	-4 224 274.56	-2 550 404.71
ACCUM (FUNDS) / SHORTFALL ON 31/12/2010	-5 078 683.48	-4 224 274.56
Min: BALANCE SHEET ITEMS	352 307.95	92 714.13
CREDITOR PROVISION BALANCING	-910.00	0.00
DEB CONTR-DT SYSTEM	353 217.95	92 714.13
FUNDS AVAILABLE ON 31/12/2010	-4 726 375.53	-4 131 560.43

JW Roux
Senior Director: Finance & Asset Management



Statements for SANERI Funds (CP 11550)



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Statement of Income and Expenditure - OSP Centre -11550

For the period ending :	31/12/2010	31/12/2009
TOTAL INCOME	-6 451 447.74	-6 331 322.13
INCOME: BURSARY	-2 527 500.00	-99 396.68
INCOME: SUNDRY TAXABLE	-8 329.73	-8 559.06
INTEREST RECEIVE: INTERNAL ALL	-85 449.62	-76 789.73
PROFIT: EXCHANGE RATE FOREIGN	-368.39	-76.66
SUNDRY INCOME: NON TAXABLE	-3 829 800.00	-6 146 500.00
TOTAL EXPENDITURE	5 018 008.32	5 474 565.85
CURRENT EXPENDITURE		
ADVERTISEMENTS: GENERAL	109 616.70	94 117.85
ADVERTISEMENTS: POSTS	0.00	38 258.65
AFFILIATION & REGISTRATION EXP	29 140.92	45 905.41
BURSARY POST GRADUATE	2 638 500.00	3 358 474.49
CELL PHONE AIRTIME	9 246.46	4 202.29
CELL PHONE RENT	5 734.98	5 801.70
CLEANING MATERIALS	0.00	119.14
COMPUTER MATERIALS	10 708.75	5 390.87
CONSULTATION FEES	264 250.54	335 263.38
CONSUMABLE MATERIALS	3 842.26	391.55
COPY AND PRINTING	15 177.64	20 184.00
COURSES	1 368.00	4 162.45
ENTERTAINMENT: GENERAL	46 954.52	29 943.54
FLOWERS, WREATHS, GIFTS	2 060.97	3 387.95
FOREIGN EXCHANGE LOSS	32.48	214.86
FOREIGN TRAVEL & SUBSISTENCE	53 196.96	27 365.00
INTEREST PAID: INTERNAL APPOR	5 987.94	9 095.39
INTERNET NETWORK EMAIL LEVY	6 369.46	23 134.27
MAINTENANCE OF APPARATUS EN/O	0.00	342.00
NON-CAPITALISED BOOKS	4 400.00	1 569.00
POSTAGE STAMPS AND TELEGRAMS	1 698.65	325.16
PROMOTION MATERIAL	513.00	10 326.70
RENT OF ROOMS	0.00	500.00
SERVICES	32 985.22	15 483.00
SMALLER FURNITURE AND EQUIPMEN	8 738.10	6 967.04
SOFTWARE	2 398.56	0.00
STATIONERY	16 522.07	17 254.44
SUBSCRIPTION BOOKS & MAGAZINES	3 052.40	600.00
SUNDRY EXPENSES	10 000.00	0.00
TELEPHONE INSTALLATION COSTS	394.44	0.00
TELEPHONE: CALLS	9 564.15	10 916.75
TELEPHONE: RENT	17 501.59	20 409.88
TOTAL REMUNERATION	1 580 291.71	1 247 092.61
TRAVEL & SUBSISTENCE: DEPARTM	63 299.61	94 616.91
TRAVEL & SUBSISTENCE: NON TEAT	28 105.22	11 321.04
WORKSHOPS	15 849.00	10 350.00
ASSET TRANSACTIONS		
ASSET PURCHASES	20 506.02	21 078.53
OPERATING (SURPLUS) / SHORTFALL FOR PERIOD	-1 433 439.42	-856 756.28





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Statement of Income and Expenditure - OSP Centre -11550

For the period ending :	31/12/2010	31/12/2009
FUNDS TRANSFERS	1 285 569.03	698 511.00
TRANSFERS FROM	1 285 569.03	698 511.00
NET (SURPLUS) / SHORTFALL FOR THE PERIOD	-147 870.39	-158 245.28
Plus: ACCUM (FUNDS) / SHORTFALL ON 01/01/2010	-1 699 343.22	-1 541 097.94
ACCUM (FUNDS) / SHORTFALL ON 31/12/2010	-1 847 213.61	-1 699 343.22
Min: BALANCE SHEET ITEMS	-910.00	0.00
CREDITOR PROVISION BALANCING	-910.00	0.00
FUNDS AVAILABLE ON 31/12/2010	-1 848 123.61	-1 699 343.22

JW Roux
Senior Director: Finance & Asset Management



Appendix D: Approved Budget for 2011

		<u>2010</u>	<u>2011</u>
Staffing		R 3 092 800	R 3 241 000
	Core staff	R 1 652 800	R 1 747 000
	Academic staff	R 1 440 000	R 1 494 000
Running Expenses		R 482 000	R 490 000
	Tel, Fax and Internet	R 60 000	R 65 000
	Stationary & Printing	R 22 000	R 25 000
	Advertisement & Website	R 150 000	R 130 000
	Conferences & Workshops	R 70 000	R 80 000
	Travel (Staff)	R 70 000	R 80 000
	Travel (Students and Visiting Academics)	R 40 000	R 40 000
	Schools Programme	R 70 000	R 70 000
Academic Expenses		R 45 000	R 45 000
	Teaching Material & Books	R 45 000	R 45 000
Capital Expenses		R 145 000	R 201 000
	Office Furniture	R 10 000	R 20 000
	Classroom Furniture	R 10 000	R 10 000
	Computer Equipment (Students)	R 100 000	R 150 000
	Computer Equipment (Staff)	R 25 000	R 21 000
Contingency		R 65 000	R 60 000
	1% of Total	R 65 000	R 60 000
<u>Total Grant (Operating Budget) from DST</u>		R 3 829 800	R 4 037 000¹
Bursaries			
	<u>DST Allocation</u>	R 2 500 000	R 3 000 000
	Continuing Students		R 1 920 000
	New Bursaries		R 1 080 000
<u>Total Grant (For Bursaries) from DST</u>		R 2 500 000	R 3 000 000
<u>GRAND TOTAL OF DST GRANT</u>		R 6 329 800	R 7 037 000

Notes:

- ¹ R 3m escalated by 6,5% in 2007, with 11,3% in 2008, with 7,1% in 2009 and 5% in 2010 as the actual and projected annual average CPIX/CPI values.
- ² This is for the new bursary values, R 100k (doctoral) and R 80k (masters).

Appendix E: New bursary students for 2011

CRSES New Bursaries for 2011					
	Name	Initials	Degree	Male/Female	Equity group
Mr	Manasoe	Benjamin	PhD	Stellenbosch University	Black
Mr	Owen	Michael TF	PhD		White
Mr	Gerber	Stiaan	PhD		White
Mr	Graaff	Simon dV	MScEng		White
Mr	Walker	Gregg	MScEng		White
Mr	Kooverij	Bavesh	MScEng		Black
Ms	Du Toit	Louise	PhD - University of Cape Town	F	White
Ms	Vossberg	Chyrilyn	MPhil - University of Cape Town	F	White
Mr	Nagar	Ravindra	MEng - University of Pretoria	M	Black
Ms	Hosking	Jessica	MCom - NMMU	F	White
Mr	Gerber	Jacques D	MSc - NMMU	M	White



Appendix F: Publications of students and staff of the Centre

JOURNAL ARTICLES

2008	
1.	SULIMAN R., LIEBENBERG L., MEYER J.P. (2008), "Updated Low Mass Flux Transition Criterion during Refrigerant Condensation in Smooth Horizontal Tubes", Proceedings of the 6 th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Paper no. SR1, Pretoria, South Africa, 30 June – 2 July 2008.
2009	
1.	SULIMAN R., LIEBENBERG L. and MEYER J.P. , "Improved Flow Pattern Map for Accurate Prediction of the Heat Transfer Coefficients during Condensation of R-134a in Smooth Horizontal Tubes and Within the Low-mass Flux range", International Journal of Heat and Mass Transfer, Vol. 52, No. 25-26, pp. 5701-5711, 2009.
2.	BRENT AC, WISE R, FORTUIN H , 2009. The viability of the South African biofuels industrial strategy. International Journal of Environment and Pollution 39 (1/2), 74-91.
3.	TAVIV R, BRENT AC, FORTUIN H , 2009. An environmental impact tool to assess national energy scenarios. International Journal of Environmental Science and Engineering 1 (4), 183-188.
4.	BARRY M-L, STEYN H, BRENT AC , 2009. The use of the focus group technique in management research: The example of renewable energy technology selection in Africa. Journal of Contemporary Management 6, 229-240.
5.	BARRY M-L, STEYN H, BRENT AC , 2009. Determining the most important factors for sustainable energy technology selection in Africa. South African Journal of Industrial Engineering 20 (2), 33-51.
6.	BRENT AC, HIETKAMP S, WISE RM, O'KENNEDY K , 2009. Estimating the carbon emissions balance for South Africa. South African Journal of Economic and Management Sciences 12 (3), 263-279.
2010	
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